AS/NZS CISPR 32:2015+AMD 1:2020

TEST REPORT

For

Lumi United Technology Co., Ltd

Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Test Model: PS-S03D
Multiple Model: PS-S03E

Report Type:	**Product Type:**
Revised Report	Presence Sensor FP1E

Report Number:	2402S31167-09M1
Report Date:	2024/5/30
Reviewed By:	Rocky Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) (No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China) Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402S31167-09	Original Report	2024/5/27
2.0	2402S31167-09M1	Revised Report	2024/5/30

Note:
1. Remove the declaration of similarity letter;
2. Update the test equipment list.

This report is to supersede the test report 2402S31167-09 which issued on 2024/5/27.

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Presence Sensor FP1E
EUT Model:	PS-S03D
Multiple Model:	PS-S03E
Model Difference:	PS-S03D and PS-S03E have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical, except sales area and packaging are different
Rated Input Voltage:	DC 5V
Serial Number:	2JP1-1
EUT Received Date:	2024/4/11
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***Lumi United Technology Co., Ltd*** in accordance with AS/NZS CISPR 32:2015+AMD 1:2020 Electromagnetic compatibility of multimedia equipment−Emission Requirements.

The objective is to determine the compliance of EUT with: AS/NZS CISPR 32:2015+AMD 1:2020.

Test Methodology

All measurements contained in this report were conducted with AS/NZS CISPR 32:2015+AMD 1:2020 Electromagnetic compatibility of multimedia equipment−Emission Requirements.

Declarations

The information marked ▲ is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with ★.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test Mode: Working

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

N/A

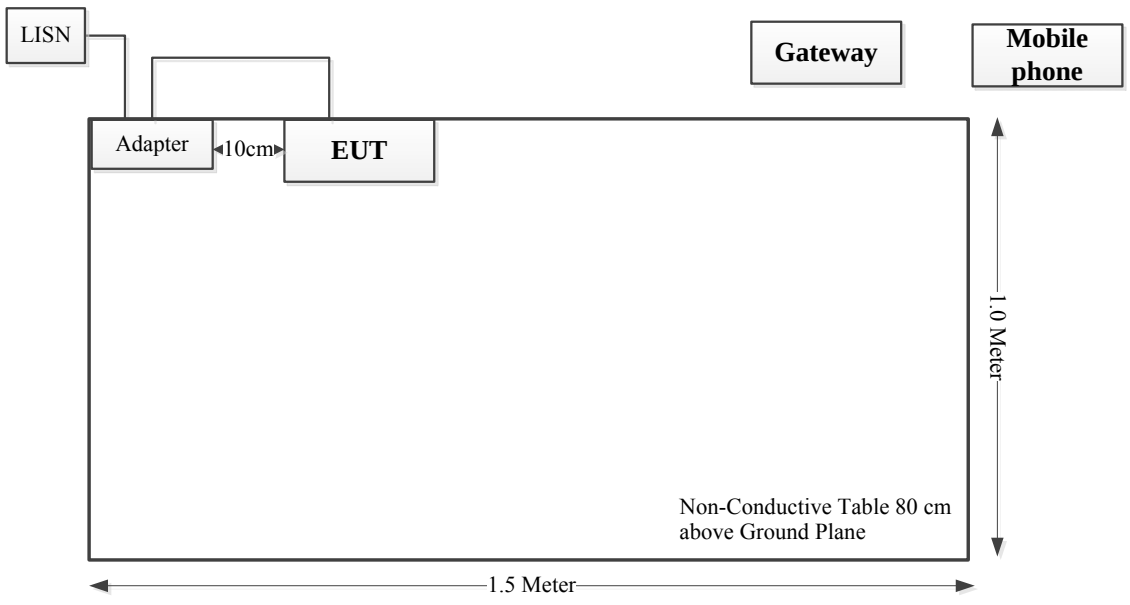
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Gushi	Adapter	GS-0500200	unknown
Apara	Gateway	ZHWG12LM	unknown
Kruger&Matz	Mobile phone	DRIVE_6	unknown

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV216	101614	2023/10/18	2024/10/17
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2023/9/5	2024/9/4
R&S	EMI Test Receiver	ESCI	100035	2023/8/18	2024/8/17
R&S	Test Software	EMC32	V9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Hybrid Antenna	JB3	A060611-3	2024/1/12	2027/1/11
Wilson	Coaxial Attenuator	859936	F-08-EM014	2024/1/12	2027/1/11
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2023/7/1	2024/6/30
Sonoma	Amplifier	310N	372193	2023/7/1	2024/6/30
R&S	EMI Test Receiver	ESR3	102453	2023/8/18	2024/8/17
Audix	Test Software	E3	191218 (V9)	N/A	N/A
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2023/9/7	2026/9/6
Xinhang Macrowave	Coaxial Cable	XH750A-N/J-SM A/J-10M	20231117004 #0001	2023/11/17	2024/11/16
AH	Preamplifier	PAM-0118P	469	2023/8/19	2024/8/18
R&S	Spectrum Analyzer	FSV40	101944	2023/10/18	2024/10/17
Audix	Test Software	E3	191218 (V9)	N/A	N/A

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emission	Radiated emissions below 1GHz	Radiated emissions above 1GHz
Temperature:	25.3℃	26.7℃	26.8℃
Relative Humidity:	62%	52%	46%
ATM Pressure:	100.1kPa	100.1kPa	100.3kPa
Tester:	Lane Sun	Bill Yang	Colin Yang
Test Date:	2024/4/20	2024/4/20	2024/4/24

SUMARY OF TEST RESULTS

Clause	Description of Test	Test Result
AS/NZS CISPR 32 §A.3	Conducted emissions	Compliant
AS/NZS CISPR 32 §A.2	Radiated emissions	Compliant

AS/NZS CISPR 32:2015+AMD 1:2020 §A.3 – CONDUCTED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If $U_{lab}$is less than or equal to U_{cispr} of Table 1, then:
-compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
-non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If $U_{lab}$is greater than $U_{cispr}$of Table 1, then:
-compliance is deemed to occur if no measured disturbance level, increased by (U_{lab}− U_{cispr}), exceeds the disturbance limit;
-non - compliance is deemed to occur if any measured disturbance level, increased by(U_{lab} − U_{cispr}), exceeds the disturbance limit.

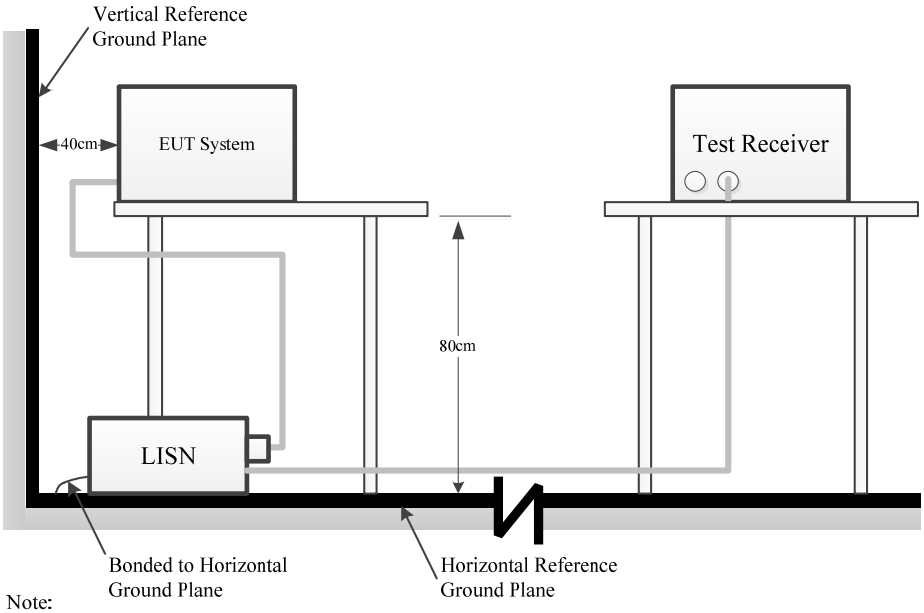
Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz), and conducted disturbance at telecommunication port using AAN is 5.0 dB (150 kHz to 30 MHz).

Table 1 - Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)	3.8 dB
(150 kHz to 30 MHz)	3.4 dB
Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz) Conducted	2.9 dB
disturbance at telecommunication port using AAN (150 kHz to 30 MHz) Conducted	5.0 dB
disturbance at telecommunication port using CVP (150 kHz to 30 MHz) Conducted	3.9 dB
disturbance at telecommunication port using CP (150 kHz to 30 MHz)	2.9 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Note:
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at least 80 cm from other units and oter metal planes support units.

The setup of EUT is according with CISPR 16-1-1:2010+A1:2010, CISPR 16-2-1:2008+A1:2010 measurement procedure. The specification used was the CISPR 32 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

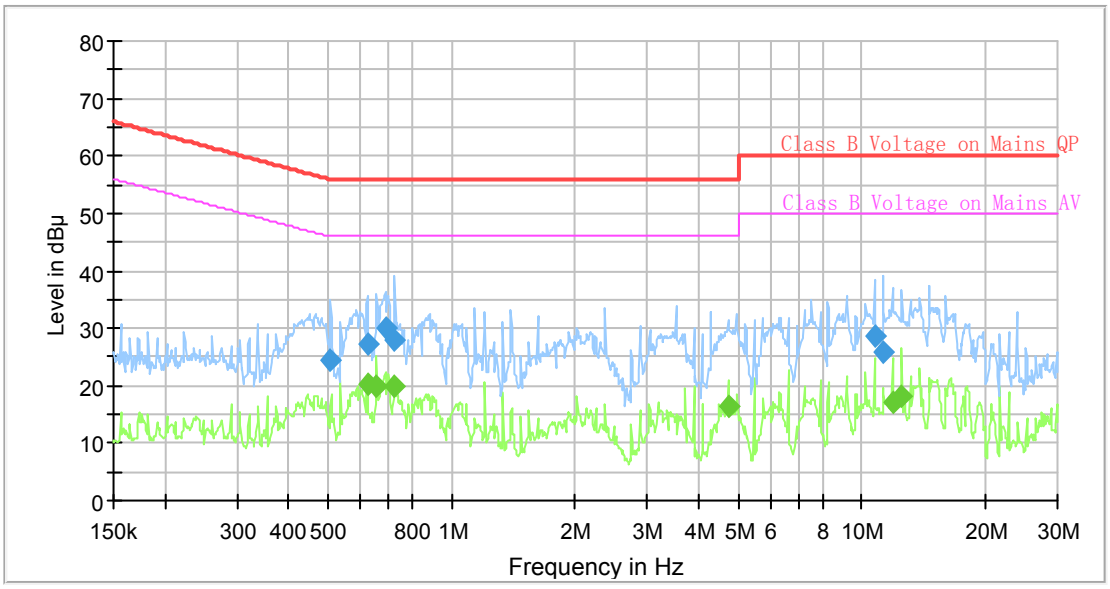
Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

Test Data

Please refer to following table and plots:

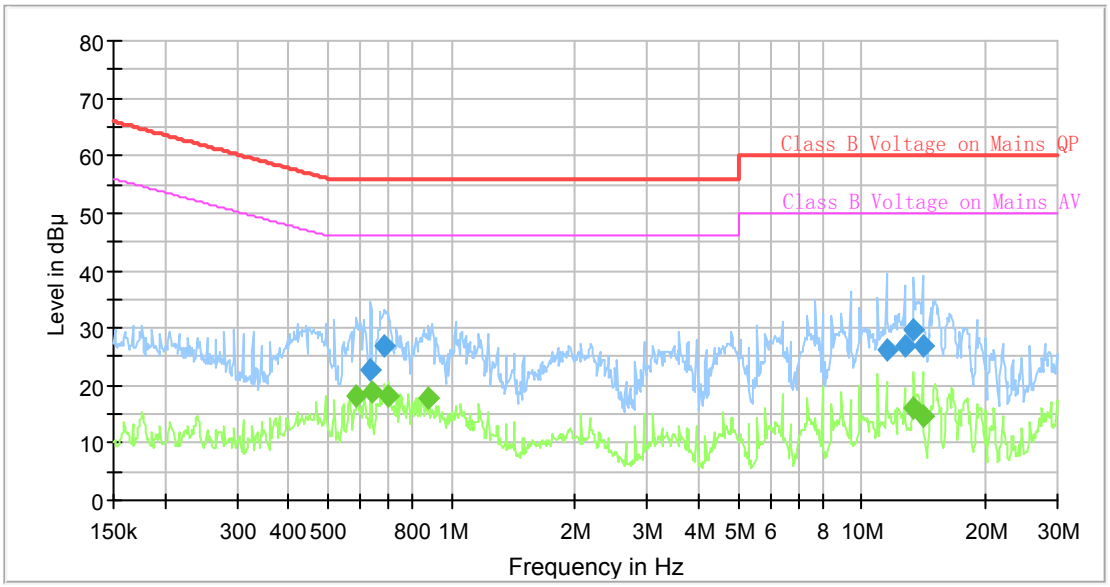
Port:	L
Test Mode:	Working
Power Source:	AC 230V/50Hz
Note:	2JP1-1



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.506536	24.31	---	56.00	31.69	9.000	L1	10.8
0.624575	---	20.36	46.00	25.64	9.000	L1	10.8
0.624575	27.15	---	56.00	28.85	9.000	L1	10.8
0.656516	---	19.87	46.00	26.13	9.000	L1	10.8
0.690091	30.17	---	56.00	25.83	9.000	L1	10.9
0.725382	27.86	---	56.00	28.14	9.000	L1	10.9
0.725382	---	19.83	46.00	26.17	9.000	L1	10.9
4.731578	---	16.27	46.00	29.73	9.000	L1	10.8
10.721119	28.60	---	60.00	31.40	9.000	L1	10.8
11.269399	25.83	---	60.00	34.17	9.000	L1	10.8
11.904946	---	17.12	50.00	32.88	9.000	L1	10.8
12.513766	---	18.01	50.00	31.99	9.000	L1	10.8

Port:	N
Test Mode:	Working
Power Source:	AC 230V/50Hz
Note:	2JP1-1



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.588291	---	18.24	46.00	27.76	9.000	N	10.7
0.633991	22.66	---	56.00	33.34	9.000	N	10.7
0.637161	---	19.03	46.00	26.97	9.000	N	10.7
0.686657	27.02	---	56.00	28.98	9.000	N	10.8
0.703996	---	18.24	46.00	27.76	9.000	N	10.8
0.881136	---	17.94	46.00	28.06	9.000	N	10.8
11.496483	26.03	---	60.00	33.97	9.000	N	10.9
12.765925	26.99	---	60.00	33.01	9.000	N	10.9
13.418776	29.74	---	60.00	30.26	9.000	N	10.9
13.418776	---	16.03	50.00	33.97	9.000	N	10.9
14.105014	---	14.52	50.00	35.48	9.000	N	10.9
14.105014	27.03	---	60.00	32.97	9.000	N	10.9

AS/NZS CISPR 32:2015+AMD 1:2020 §A.2 – RADIATED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
−compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
−non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
−compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
−non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

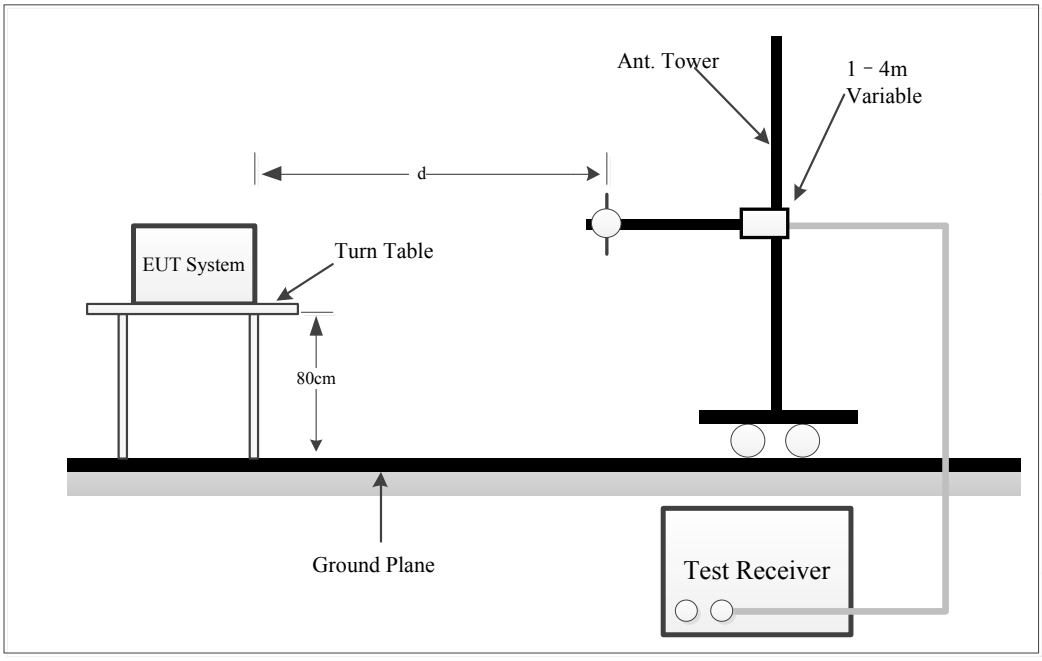
Table 1 - Values of U_{cispr}

Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)(6 GHz to 18 GHz)	5.5 dB

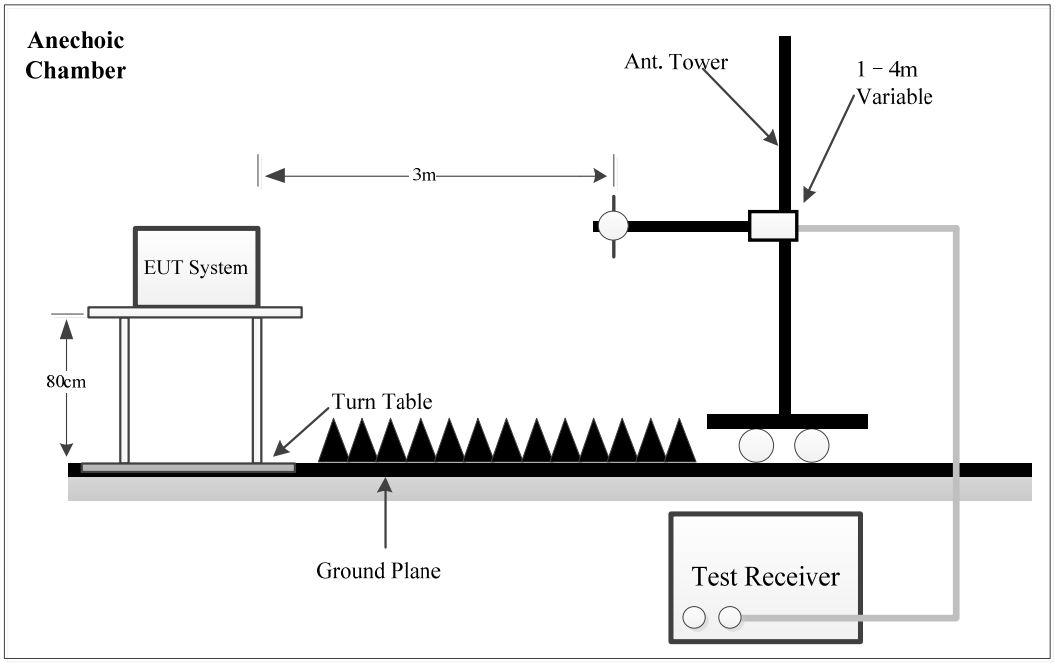
Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, above 1GHz were performed in the 3 meters, using the setup accordance with the CISPR 16-1-1:2010+A1:2010, CISPR 16-1-4:2010, CISPR 16-2-3:2010. The specification used was AS/NZS CISPR 32 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver and Spectrum Analyzer Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver(Below 1GHz) and Spectrum Analyzer(Above 1GHz) were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz - 1000 MHz	100 kHz	300 kHz	/	Peak
	/	/	120kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10Hz	/	Ave.

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

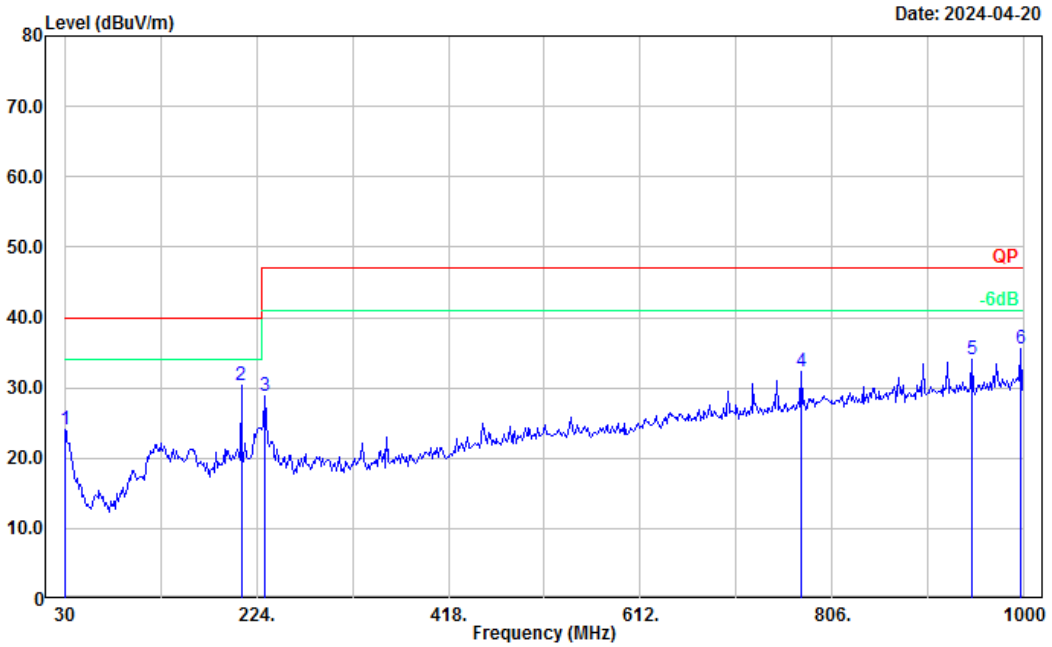
The basic equation is as follows:
Result = Meter Reading+ Corrected
Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain, or
Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class B. The equation for margin calculation is as follows: Margin = Limit – Result

Test Data

Please refer to following table and plots:

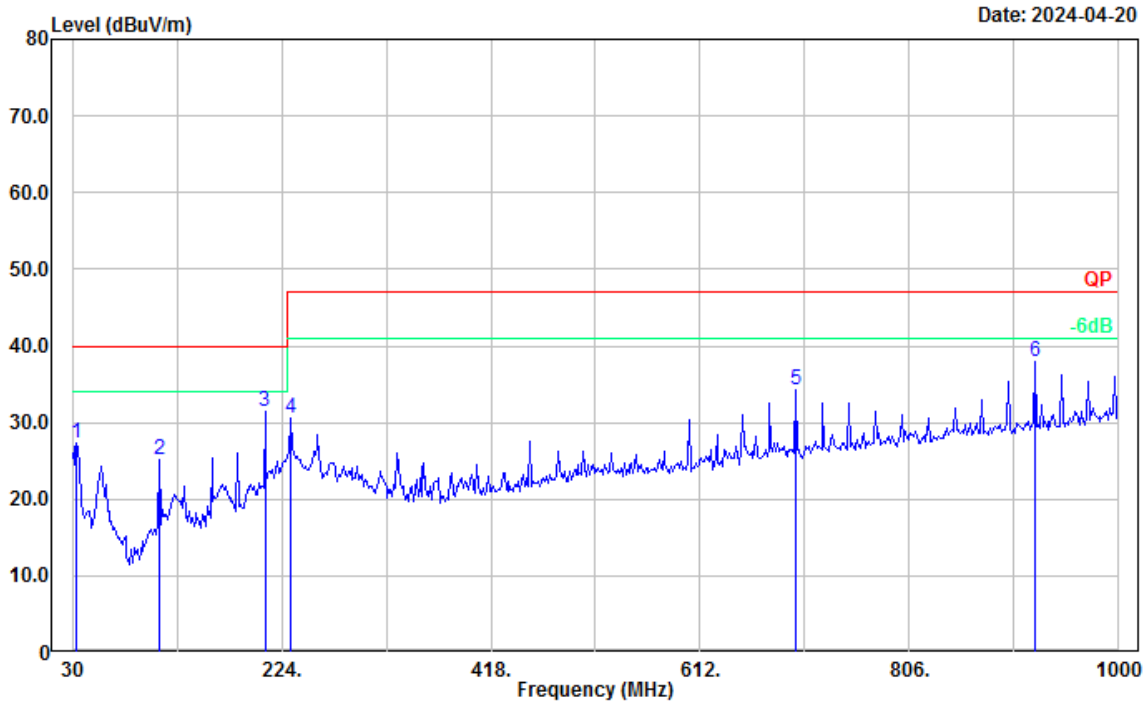
Below 1G

Project No.: 2402S31167-RF Serial No.: 2JP1-1
Polarization: Horizontal Tester: Bill Yang
Test Mode: Working
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.00	27.14	-2.99	24.15	40.00	15.85	Peak
2	208.54	41.23	-10.79	30.44	40.00	9.56	Peak
3	232.43	39.71	-10.89	28.82	47.00	18.18	Peak
4	775.07	31.44	0.96	32.40	47.00	14.60	Peak
5	946.58	29.98	3.96	33.94	47.00	13.06	Peak
6	995.78	30.37	5.10	35.47	47.00	11.53	Peak

Project No.: 2402S31167-RF Serial No.: 2JP1-1
Polarization: Vertical Tester: Bill Yang
Test Mode: Working
Note:

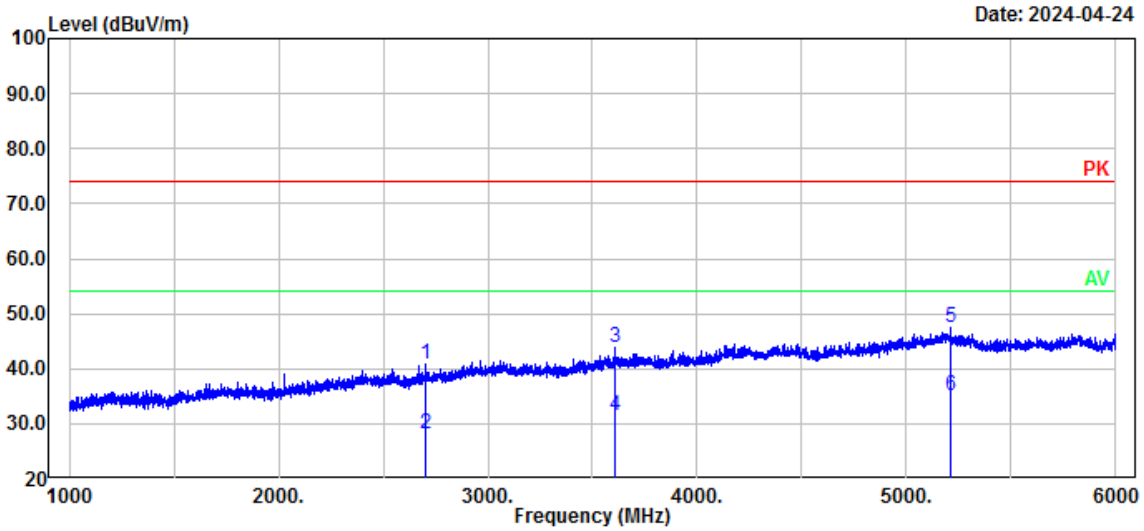


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	34.22	33.09	-5.80	27.29	40.00	12.71	Peak
2	110.13	36.04	-10.88	25.16	40.00	14.84	Peak
3	208.54	42.29	-10.79	31.50	40.00	8.50	Peak
4	232.44	41.39	-10.89	30.50	47.00	16.50	Peak
5	700.57	34.86	-0.59	34.27	47.00	12.73	Peak
6	922.68	34.13	3.75	37.88	47.00	9.12	Peak

Above 1G

Project No.: 2402S31167-RF
Polarization: Horizontal
Test Mode: Working
Note:

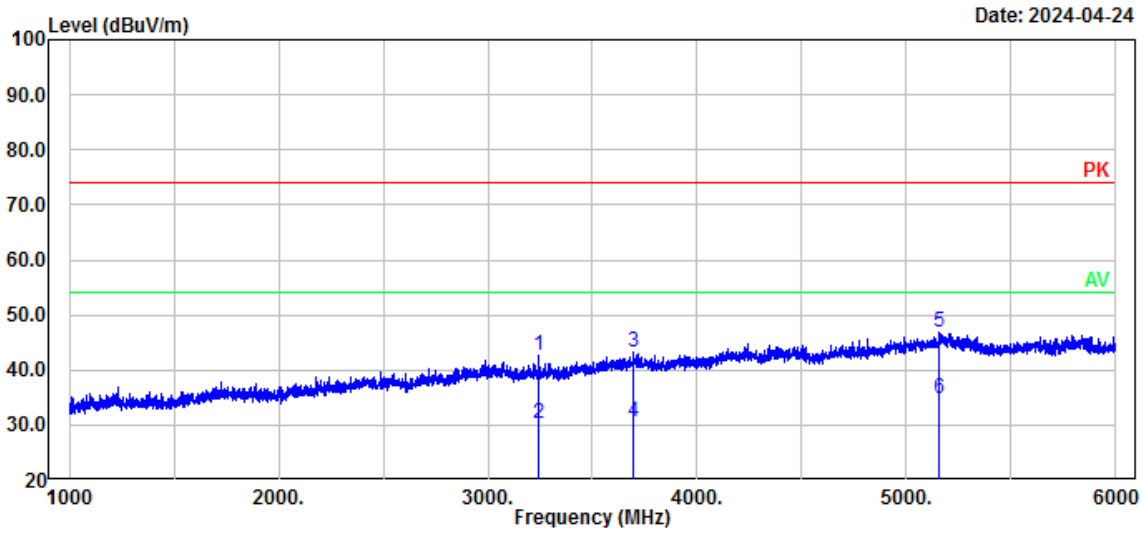
Serial No.: 2JP1-1
Tester: Colin Yang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	2701.00	47.90	-6.98	40.92	74.00	33.08	Peak
2	2701.00	35.28	-6.98	28.30	54.00	25.70	Average
3	3605.00	48.95	-5.04	43.91	74.00	30.09	Peak
4	3605.00	36.64	-5.04	31.60	54.00	22.40	Average
5	5213.00	48.09	-0.68	47.41	74.00	26.59	Peak
6	5213.00	35.87	-0.68	35.19	54.00	18.81	Average

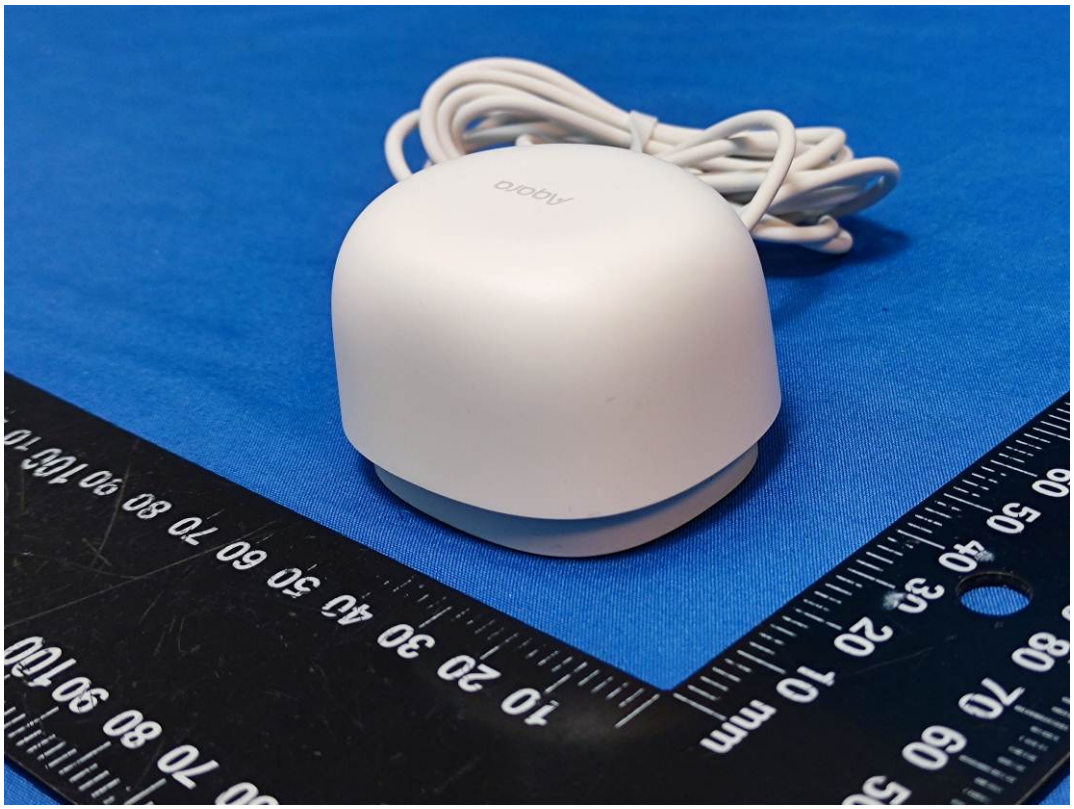
Project No.: 2402S31167-RF
Polarization: Vertical
Test Mode: Working
Note:

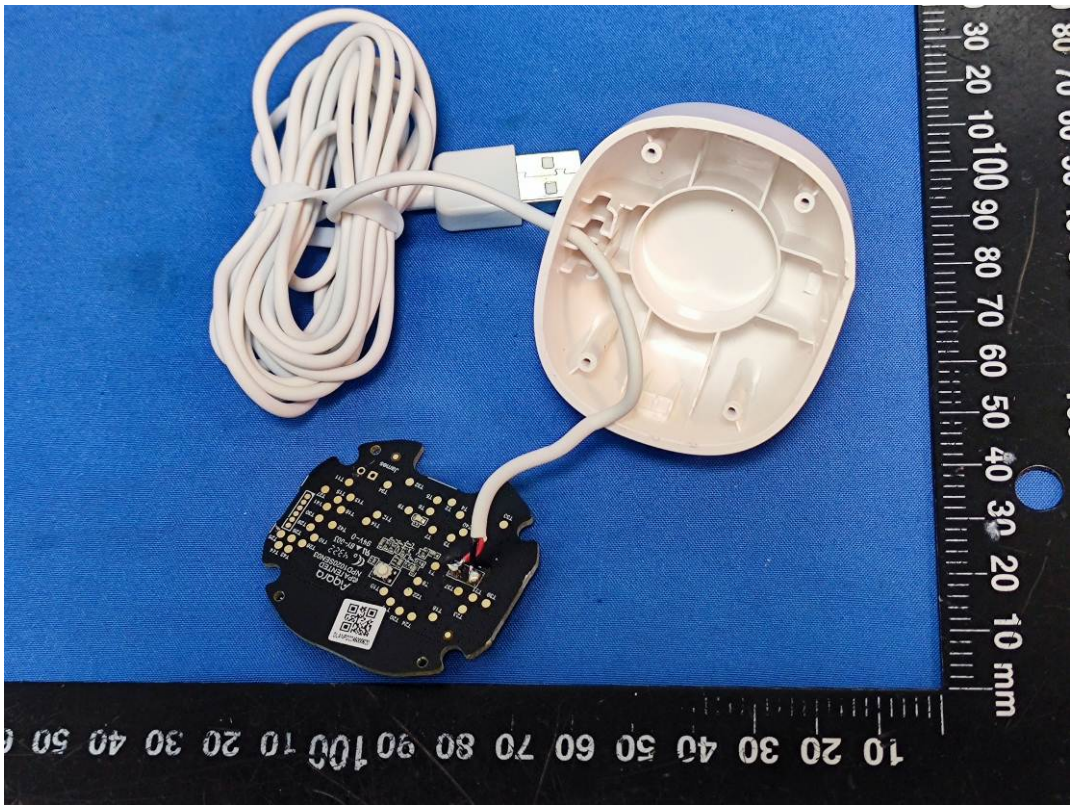
Serial No.: 2JP1-1
Tester: Colin Yang

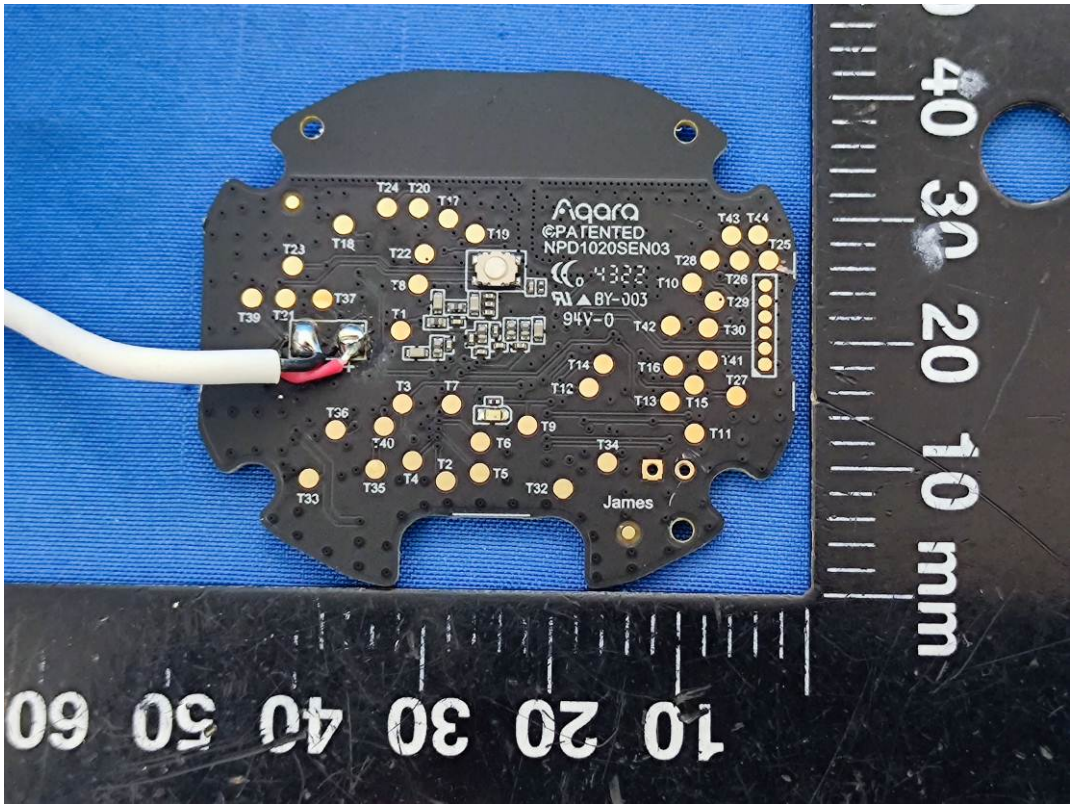


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	3241.00	48.53	-6.03	42.50	74.00	31.50	Peak
2	3241.00	36.41	-6.03	30.38	54.00	23.62	Average
3	3692.00	47.89	-4.69	43.20	74.00	30.80	Peak
4	3692.00	35.40	-4.69	30.71	54.00	23.29	Average
5	5157.00	47.96	-0.97	46.99	74.00	27.01	Peak
6	5157.00	35.63	-0.97	34.66	54.00	19.34	Average

EXHIBIT A – EUT PHOTOGRAPHS



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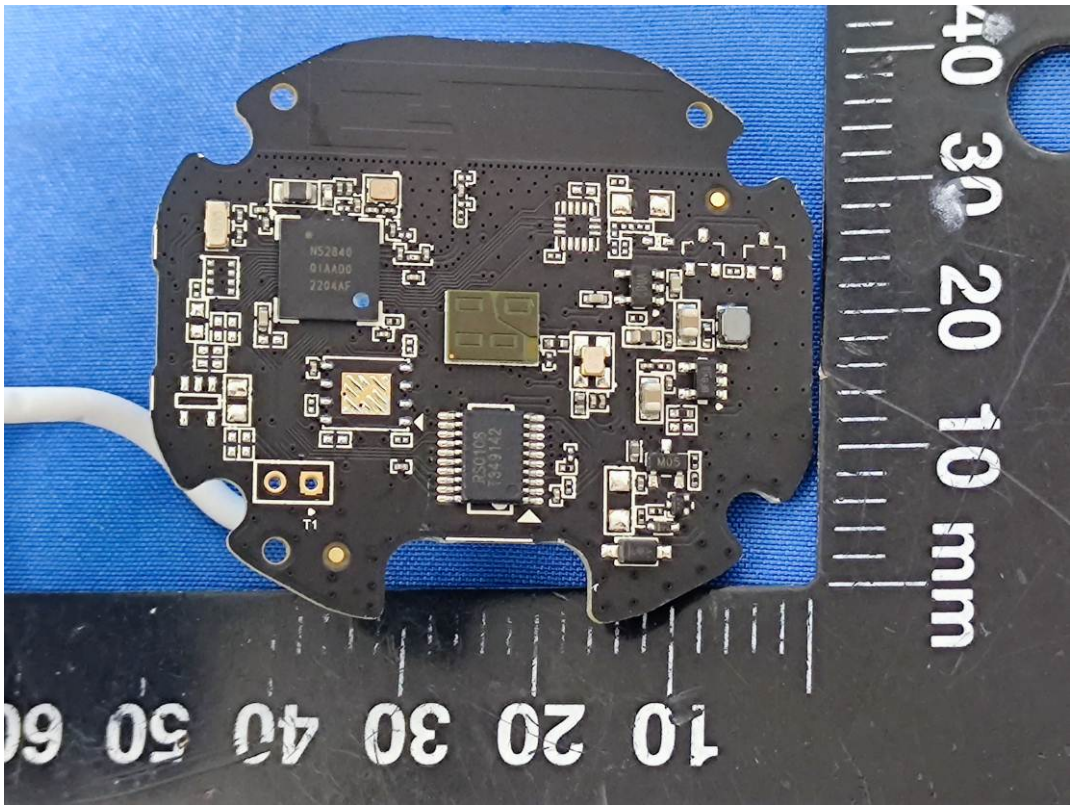
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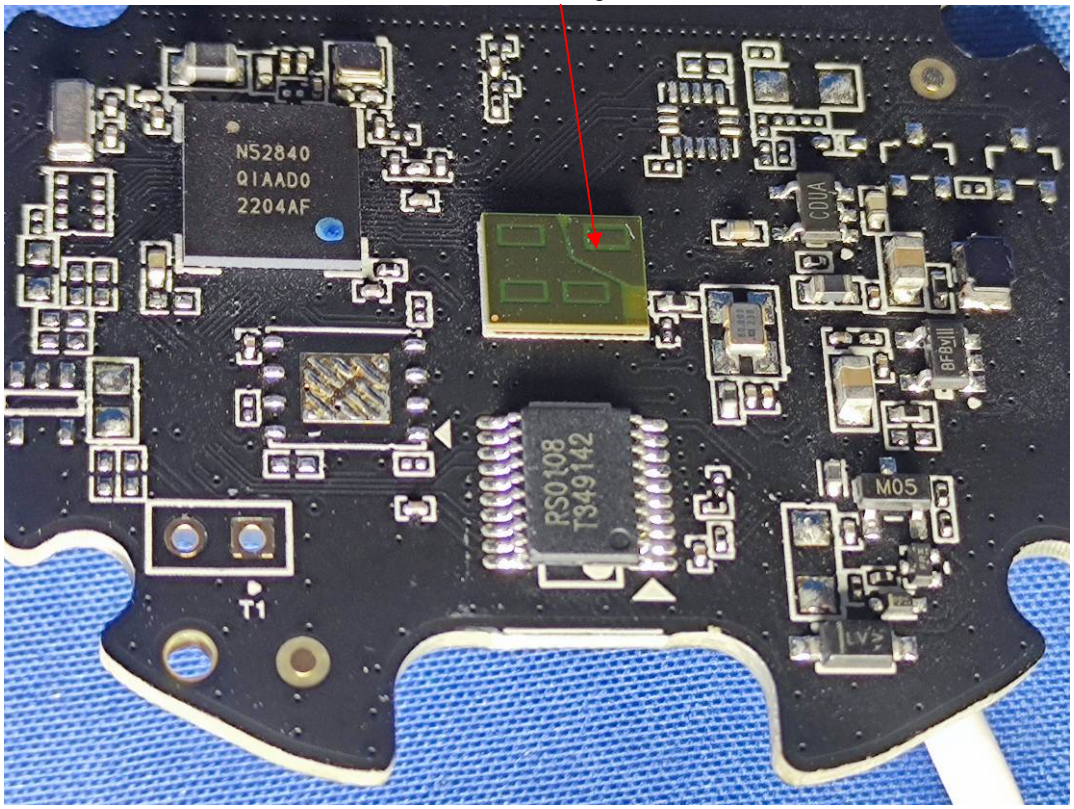
60G Radar Chipset



Zigbee Antenna

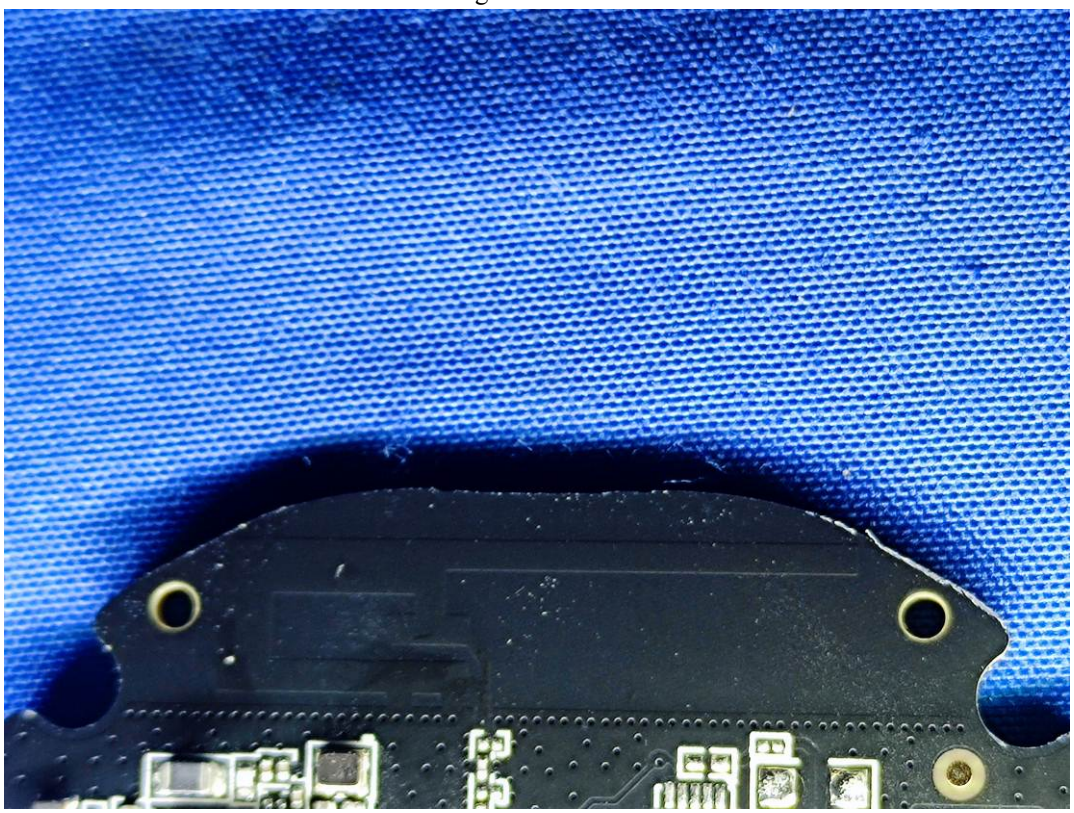


EXHIBIT B – TEST SETUP PHOTOGRAPHS

Radiated Emissions

RE Below 1GHz front View

RE Below 1GHz rear View

RE Above 1GHz front View

RE Above 1GHz rear View

Conducted emissions_AC

CE front View

CE side View

*******END OF REPORT*******